

TWO NEW GENERA OF VERNONIEAE (ASTERACEAE) FROM BRASIL

HETEROCYPSELA AND *PSEUDOSTIFFTIA*

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Brasil is a major center of diversity for the Vernonieae, and of the 70 genera listed by Jones (1977) in his review of the tribe, 27 occur in that country. Many of the genera are endemic to Brasil, including all of the typical element of the subtribe Lychnophorinae. Additional undescribed genera are to be expected, from both re-evaluation of previously described species, and from the discovery of totally undescribed entities. Two genera of the latter type are described here, *Heterocypsel*a from the State of Minas Gerais and *Pseudostiff*tia from Bahia, the former distinguished by the markedly dimorphic achenes in the head, and the latter showing an incrassate style form unlike those in any other members of the Vernonieae.

HETEROCYPSELA ANDERSONII H. Robinson, genus et sp. nov.

Plantae herbaceae perennes 1.5 m altae. Caules fulvescentes teretes striati glandulo-punctati et evanescentiter appresse piliferi, pilis T-formibus sessilibus, internodiis ad 7 cm longis. Folia alterna membranacea inferiora base petioliformia superiora subsessilia, petiolis ad 5 mm longis; laminae inferiores oblanceolatae plerumque ca. 18 cm longae et ca. 6 cm latae base anguste cuneatae attenuatae margine superne sensim argute serrulatae apice subabrupte argute acuminatae; laminae superiores lanceolatae vel oblongo-lanceolatae plerumque 7-14 cm longae et 2-4 cm latae base subrotundatae vel obtusae margine argute serrulatae apice leniter argute acuminatae supra sparse evanescentiter appresse piliferae subtus dense glandulo-punctatae et densius appresse piliferae, pilis T-formibus, nervis secundariis utrinque 8-10 ca. 45° ascendentibus, nervulis indistinctis. Inflorescentiae valde cymosae, ramis secundariis ad 14 cm longis, ramis ultimis 5-30 mm longis dense canescentiter piliferis. Capitula late campanulata ca. 15 mm alta et 12-15 mm lata; squamae involucri 70 subimbriatae ca. 6-seriatae 3-8 mm longae, exteriores lineares vel filiformes laxe patentis, ceterum base ovatae vel oblongo-lanceolatae ad 1.8 mm latae apice distincte caudato-acuminatae in acuminis 1.5-3.5 mm longae margine dense breviter fimbriatae vel superne minute scabridulae extus scabridulae inferne callose albo-striatae in medio viridi-vittatae albo-marginatae superne interdum rubotinctae; receptacula plana glabra. Flores ca. 60-70 in capitulo. Corollae disciformes purpureae anguste infundibulares ca. 9 mm longae, tubis 3.5-4.5 mm longis base sensim angustis inferne

glabris superne dense hirtellis, faucibus ca. 2 mm longis inferne hirtellis superne sensim scabridulis, lobis recurvatis linearibus ca. 3 mm longis et 0.4 mm latis extus scabridulis apice perdense scabridulis; filamenta in parte inferiore tenua in parte superiore distincta ca. 0.2 mm longa; thecae antherarum ca. 2.7 mm longae; appendices antherarum anguste ovatae ca. 0.5 mm longae et 0.3 mm latae apice subobtusae abaxialiter et in connectivis sparse minute glanduliferae; basi stylorum distincte parve noduliferi; styli superne in scapis et ramis dense longe scabridulae, ramis filiformibus ca. 2 mm longis. Achaenia biformia; achaenia exteriora obcompressa triangularis ca. 3 mm longa et 2 mm lata glabra laevia in marginis lateralibus distincte alata; cellulis superficialibus achaeniorum subquadratis 12-25 μ m in diam. in partibus collenchymatis crystalliferis; pappus multisetosus perfacile deciduus, setae plerumque ca. 4 mm longae setae breviores ad 0.7 mm longae; achaenia interiora prismatica immatura ad 2 mm longa setifera; setae pappi aliquantum persistentes ca. 40 plerumque ca. 5 mm longae base tenues supra basem latiores, seriebus exteriores nullis. Grana pollinis 40-50 μ m in diam. valde lophorata, cristis altis minute multo spinuliferis, spinis majoribus nullis (reticulation mostly the *V. cognata*-type of Stix, 1960, with polar areole, variations involve a wall partially separating the area of the pore from the upper and lower extensions of the colpar areole, and the polar areole sometimes being 5-sided rather than 6-sided.

TYPE: BRASIL: Minas Gerais: 15 km by road W. of Januária on road to Serra das Araras; elev. 575-650 m; hill of raw jagged limestone and tall forest at its base. Herb 1.5 m tall, with perennial base; flowers purple; limestone. 20 April 1973. *William R. Anderson, P. A. Fryxell, S. R. Hill, R. Reis dos Santos & R. Souza 9223* (Holotype UB, isotype US).

Heterocypsela is named after the strikingly dimorphic achenes of the head, the most extreme example of such dimorphism seen in the tribe. Two other genera of the tribe have some achene dimorphism, *Lychnophoropsis* Sch. Bip. and *Pithecoseris* Mart. in DC., both from Brasil and both members of the subtribe Lychnophorinae, having clustered heads and only 3-15 flowers in each head. In these genera the outer achenes differ only in being glabrous and in having a somewhat differentiated pappus. The pappus elements of the inner achenes are usually more persistent and sometimes broader. As such, the two Brazilian genera do not seem closely related to the new genus.

Heterocypsela is evidently more closely related to the fleshy herbaceous *Dipterocypsela* Blake of Colombia. Both genera have numerous flowers in the head and both have the outer achenes obcompressed with wings on the lateral margins that extend upward as short teeth beside the pappus. In *Dipterocypsela* the comparatively immature condition of the inner flowers in the Type leaves the question of dimorphism uncertain, but at least some achenes inside the outer series seem to be as winged and glabrous

as those of the outer series. The most basic distinction between *Heterocypsel*a and *Dipterocypsel*a is the actinomorphic corolla of the former, the latter genus being one of the notable examples of asymmetric corollas in the Vernoniaeae. *Dipterocypsel*a also has the heads sessile on well-developed serially-cymose inflorescence branches, and in spite of the general similarity to *Heterocypsel*a, it seems likely that the two genera have arisen from different though related elements within the large genus *Vernonia*.

The specimen of the new genus was originally put aside because of the distinctive appearance of the long-pedunculate heads and the long-attenuate involucrel bracts. The species has a superficial resemblance to *Vernonia subulata* Baker, but the latter is an annual with dense spreading oxylepidous involucrel bracts that are evenly tapering from their base.

PSEUDOSTIFFTIA KINGII H. Robinson, genus et sp. nov.

Plantae erectae fruticosae vel subarborescentes ad 2 m altae mediocriter ramosae. Caules teretes striati appresse fulvo-puberuli vel sublepidoti. Folia alterna, petiolis ca. 5 mm longis base subabrupte latioribus; laminae coriacea distincte obovatae vel cuneiformes plerumque 4.5-8.5 cm longae et 2.5-7.0 cm latae base distincte cuneatae margine integrae apice truncatae vel leniter retusae supra et subtus appresse puberulae vel sublepidotae, nervis primariis percurrentibus vel submucronatis, nervis secundariis pinnatis utrinque ca. 8 ca. 45^o ascendentibus, nervis et nervulis utrinque prominulis. Inflorescentiae copiose thyrsoideo-paniculatae in ramis dense corymbosae, bracteis superioribus subulatis ca. 1.5 mm longis, ramis ultimis plerumque 1-3 mm longis sublepidotis. Capitula anguste campanulata vel cylindrica uniflora, involucre ca. 7 mm alto et 2.5-3.0 mm lato; squamae involucri ca. 18 subimbricatae ca. 5-seriatae valde inaequilongae ovatae vel lineari-lanceolatae 1.5-6.0 longae et 1.0-1.7 mm latae superne rubrescentes margine dense fimbriatae apice breviter acutae extus leniter distincte uni-costatae subevanescentiter sublepidotae; squamae interiores facile deciduae; receptacula glabra. Flores 1 in capitulo; corollae disciformes purpureae subcarnosae anguste infundibulares 12-13 mm longae, tubis 6-7 mm longis cylindraceutis glabris, faucibus indistinctis ca. 1.5 mm longis extus glandulo-punctatis, lobis leniter vel distincte incurvatis lanceolatis 4.0-4.5 mm longis et 1.2-1.5 mm latis extus dense glandulo-punctatis; filamenta in parte inferiore tenua in parte superiore vix discriminantia ca. 0.4-0.5 mm longa; thecae antherarum ca. 4 mm longae, cellulis endothecialibus elongatis in parietibus transversalibus 1-3-noduliferis; appendices antherarum lanceolatae ca. 1 mm longae et 0.4 mm latae glabrae margine involutae apice subacutae; base stylorum valde noduliferi, nodis abruptis ca. 1 mm latis et 0.4 mm altis; styli superne incrassati dense scabridi, ramis stylorum lanceolatis ca. 2 mm longis. Achaenia prismatica ad 4.5 mm longa

10-costata dense breviter villosa glandulifera, setis distaliter plerumque uniseriatis base plerumque biseriatis; carpodia breviter annuliformia ca. 0.6 mm lata et 0.1 mm alta, cellulis subquadratis ca. 5-seriatis; setae pappi ca. 100 plerumque uniformes capilliformes plerumque ca. 8 mm longae aliquantum persistentes superne vix latiores extus leniter complanatae, setae exteriores paucae breviores. Grana pollinis 60-70 μm in diam. subregulariter spinosa.

TYPE: BRASIL: Bahia: Município de Mucugê. Estrada que liga Mucugê. 17 km de Mucugê. Campo rupestre. Elev. ca. 1100 meters. Small tree 2 meters tall, flowers purple, most past anthesis. July 27, 1979. *R. M. King, S. A. Mori, T. S. dos Santos & J. Hage 8179* (Holotype RB, isotypes CEPEC, US). PARATYPES: BRASIL: Bahia: Município de Rio de Contas, a 10 km ao NW de Rio de Contas. Elev. 1000 meters. Subshrub branching from base, flowers white?, mostly in pappus. July 21, 1979. *R. M. King, S. A. Mori, T. S. dos Santos & J. Hage 8084* (CEPEC, US); Pico das Almas. a 18 kms. NW de Rio de Contas. Elev. 1600-1850 meters. Shrub 1½ meters tall, flowers white. July 24, 1979. *R. M. King et al. 8145* (CEPEC, US); Serra do Sincorá. By Rio Cumbuca, about 3 km. N of Mucugê on the Andaraí road. On conglomerate sandstone rock with partly burnt-over vegetation among rocks by river and neighboring hillside. Alt. ca. 850 m. Approx 41° 23'W, 13° 00'S. Shrub 2 m high. Leaves mid-green with rusty tomentum. Flowers mauve. Feb. 5, 1974. *R. M. Harley, S. A. Renvoize, C. M. Erskine, C. A. Brighton & R. Pinheiro 16024* (K).

The genus is named after the general resemblance to the Mutisian genus *Stifftia* of eastern Brasil, especially *S. uniflora* Duke. The new genus is clearly not Mutisian, however, having a short transparent anther appendage, having spherical spinose pollen with a single layer of distally branched baculae, and having some prominent glandular-punctations, all being characters indicative of the Vernoniaceae and rare or lacking in the Mutisieae.

Still, the new genus is not readily placed in the Vernoniaceae. The resemblance to various members of *Vernonia* subgenus *Critoniopsis* appears to be misleading. There are deciduous inner involucre bracts and single-flowered heads in members of the latter subgenus in the Andes and in the equivalent Mexican subgroup *Eremosis*. These characters are similarly combined in the new genus, but *Pseudostifftia* lacks the sharply differentiated outer pappus series and the irregularly crested *Lychnophora*-Type pollen that occurs in those subgroups of *Vernonia*. It is the style of *Pseudostifftia* that presents the most striking differences, having a broadened upper portion bearing only short scabridulae and broad tapering branches. This contrasts with the long hairs and slender branches typical of other Vernoniaceae. The style is more like various members of the Mutisieae and Cynareae, though the scabrosity does not terminate below in a pronounced rim. The size of the style has allowed some dissection, and the cells of the mesophyll seem to contain some unusual-

ly elastic and viscid substance. In section, the stigmatoid tissue forms a pale strongly differentiated central cylinder that is particularly evident in the broader upper part of the shaft. The fleshiness seen in the style is reflected in the thick wall of the corolla which remains with lobes somewhat incurved after flowering. The filaments are also rather fleshy, and the anther collar is scarcely differentiated. The endothelial cells are unusually elongate compared to other members of the tribe, with thickenings restricted to the upper and lower ends.

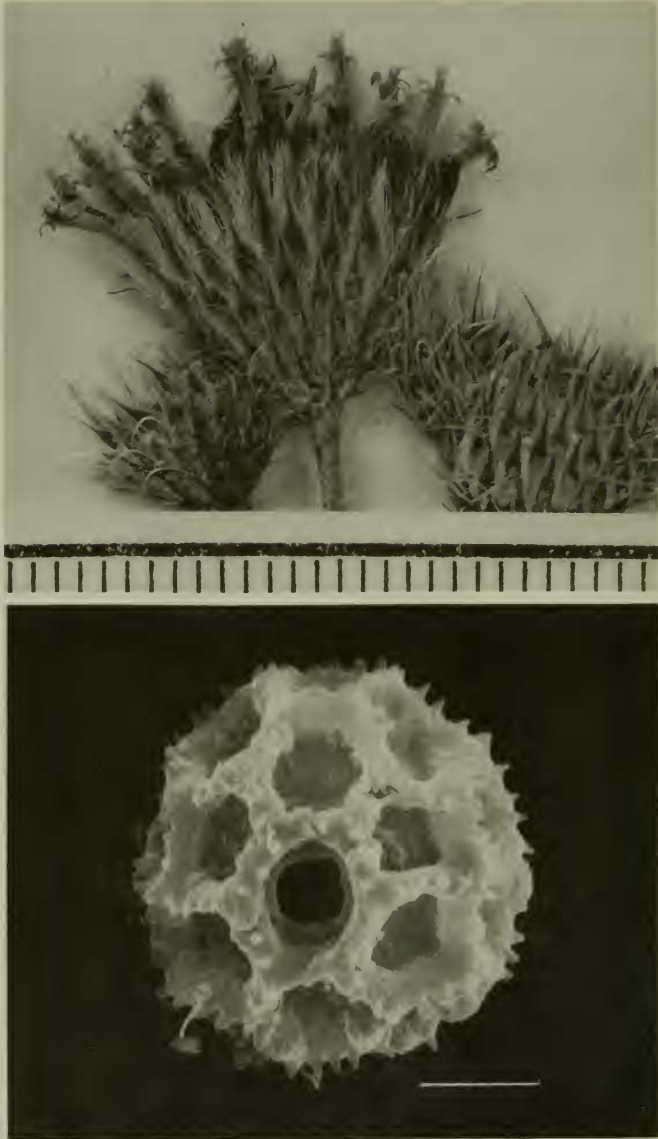
The pappus has a few shorter outer setae, but there is no sharply demarcated outer series. Such a pappus is most closely approached in the Vernoniaeae in the genus *Eremanthus*. The pollen of the new genus also approaches the type seen in *Eremanthus* and *Lychnophora*, but the surface is not at all lophorate and has almost no groupings of spines. Actually, the spines are more prominent than those observed in the typical *Lychnophora*-Type. In addition to other differences, the habit of the new genus, with its rather open thrysoid-panicle, in no way resembles the inflorescences in members of the subtribe *Lychnophorinae*.

The new genus, in spite of some superficial resemblance to some species of *Vernonia*, seems to represent an extremely isolated element in the tribe. The style form may reflect the relationship that is already recognized between the Vernoniaeae and such tribes as the Cynareae and Mutisieae, but it is not of the exact form seen in the latter tribes, while its thickness is the primary difference from other Vernoniaeae. It is believed that the incrassated styles in the various tribes reflect a similar genetic potential within the subfamily, but that they do not reflect a direct relationship between *Pseudostiffia* and the other tribes.

The single species of the genus is individually distinctive in the cuneate shape of the leaves, having tips that are usually broadly truncate to slightly retuse. The very immature Harley collection has somewhat more rounded leaf-tips, but it is evidently the same species. The collection data on two of the series of specimens indicates the flowers are white, but in these plants all the corollas had apparently fallen.

Literature Cited

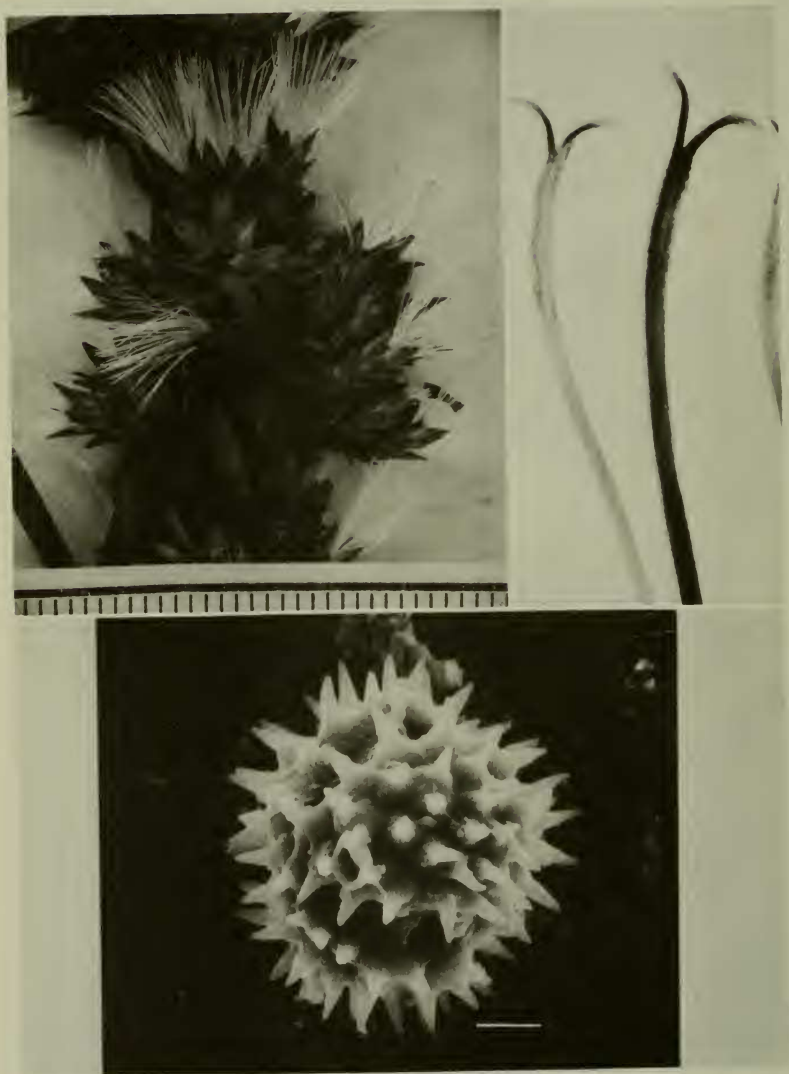
- Jones, S. B. 1977. Vernoniaeae-systematic review. In V. H. Heywood et al., eds. The Biology and Chemistry of the Compositae. 503-521.
- Stix, E. 1960. Pollenmorphologische Untersuchungen an Compositen. Grana Palynol. 2 (2): 41-104.



Heterocypselia andersonii H. Robinson. Top. Enlargement of heads. Bottom. Pollen grain with pole at top, line equals 10 μm .



Pseudostiffia kingii H. Robinson, Holotype, Jardim Botânico, Rio de Janeiro.



Pseudostiffia kingii H. Robinson. Top left. Enlargement of heads. Top right. Styles. Bottom. Pollen grain, line equals 10 μ m.